



### IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A computerized method ~~of enhancing a production recipe,~~  
comprising:  
receiving a production recipe for producing a batch of product, wherein the production  
recipe includes a sequence of actions for combining ingredients of the batch of  
product;  
annotating one or more actions of ~~[[a]]~~ the sequence of actions in the production recipe  
with a desired intention for the one or more actions, ~~wherein the production recipe~~  
~~is for producing a quantity of a product;~~  
generating an advanced recipe as output, wherein the advanced recipe comprises the  
sequence of actions and the desired intention, and wherein the advanced recipe is  
used to enable tailoring of the production recipe to specific needs.
2. (Canceled)
3. (Currently Amended) A computerized method ~~of generating a production recipe, the~~  
~~method~~ comprising:  
receiving a production recipe that includes a set of actions for combining ingredients of a  
batch of product;  
receiving knowledge associated with the batch of product from one or more sources; and  
generating through computer automated operations ~~[[a]]~~ an advanced recipe comprising  
~~[[a]]~~ the set of actions and a purpose of an underlying process, ~~wherein the recipe~~  
~~is for producing a quantity of a product.~~
4. (Currently Amended) The computerized method of claim 3 further comprising  
modifying the advanced recipe.
5. (Original) The computerized method of claim 3 wherein the knowledge is received from  
a user.

6. (Currently Amended) A computerized method for controlling a production process, the method comprising:
- receiving data from multiple knowledge sources;
  - storing the data in a structured knowledge repository; and
  - modifying a recipe for a batch processing situation using the data stored in the knowledge repository, wherein the recipe contains steps and purposes, ~~and~~ wherein the recipe is for producing a quantity of a product, and wherein the steps are steps for combining ingredients of the quantity of the product.
7. (Original) The computerized method of claim 6 wherein modifying the recipe further comprises using inputs from a user.
8. (Canceled)
9. (Currently Amended) A computerized system comprising:
- a Knowledge Builder to derive from multiple knowledge sources;
  - a Structured Knowledge Repository to store and organize the knowledge, wherein the Structured Knowledge Repository organizes knowledge and provides links between specific pieces of information and the functional purposes to which the knowledge can be put; and
  - a Decision Maker to use the knowledge stored in the structured knowledge repository to identify one or more modifications of recipe steps of a recipe, wherein the recipe steps are steps for combining ingredients of ~~is for producing~~ a quantity of a product.
10. (Original) The computerized system of claim 9 wherein the recipe is for a batch process.
11. (Previously Presented) The computerized system of claim 9 wherein the Knowledge Builder is to extract knowledge from multiple sources through one or more Machine Learning techniques.
12. (Previously Presented) The computerized system of claim 11 wherein the different Machine Learning techniques act independently from each other.
13. (Original) The computerized system of claim 12 wherein knowledge builder is scalable by adding additional the Machine Learning techniques.

14. (Original) The computerized system of claim 11 wherein the machine learning techniques are selected from the group consisting of: explanation-based learning, memory based learning, situation-dependent learning.

15. (Previously Presented) The computerized system of claim 9 wherein the Knowledge Builder is to receive feedback from a user.

16. (Original) The computerized system of claim 9 wherein the knowledge builder is scalable to incorporate new knowledge.

17. (Original) The computerized system of claim 9 wherein the knowledge builder is scalable to incorporate new knowledge extraction techniques.

18. (Original) The computerized system of claim 9 wherein the structured knowledge repository uses abstraction-decomposition space (ADS) techniques.

19. (Canceled)

20. (Previously Presented) The computerized system of claim 9 wherein the Decision Maker is to assemble the knowledge into an answer to a query.

21. (Original) The computerized system of claim 20 wherein the answer to the query is in the form of a recipe modification that meets desired goals and constraints.

22. (Previously Presented) The computerized system of claim 9 wherein the Decision Maker is to display knowledge to a user.

23. (Currently Amended) A computer-readable medium having computer-executable instructions for a method of managing a production process, the method comprising:  
receiving one or more desired purposes for the production process;  
receiving a recipe, wherein the recipe is a set of actions for producing a quantity of a product, wherein the set of actions includes actions for combining ingredients of the quantity of product; and  
generating an advanced recipe comprising the set of actions and the one or more desired purposes for the production process.

24. (Previously Presented) The computer-readable medium of claim 22, wherein the method further comprises modifying the advanced recipe in response to a user.

25. (Previously Presented) A system comprising:

a Knowledge Builder to extract a number of knowledge types from a number of sources, wherein one of the number of sources is a source based on a symbolic learning approach to extract reasons for an outcome of a step of a recipe and wherein a different one of the number of sources is a source based on an empirical approach to extract results based on what happened from a step of a recipe;

a Structured Knowledge Repository to organize and store the number of knowledge types from the number of sources in a scaffolding structure, wherein an abstraction-decomposition technique is used to organize the number of knowledge types based on an analysis of a physical domain in which the steps of the recipe are executed and how functional purposes are to be achieved within constraints provided by the physical domain; and

a Decision Maker to use the knowledge stored in the structured knowledge repository to identify one or more modifications of steps of the recipe.

26. (Previously Presented) The system of claim 25, wherein the symbolic learning approach includes an explanation-based learning approach.

27. (Previously Presented) The system of claim 25, wherein the empirical approach includes a memory based learning approach.

28. (Previously Presented) The system of claim 25, wherein the number of sources are independent of each other.

29. (Previously Presented) A computerized method comprising:

extracting a number of knowledge types from a number of sources, wherein one of the number of sources is a source based on a symbolic learning approach to extract reasons for an

outcome of a step of a recipe, and wherein a different one of the number of sources is a source based on an empirical approach to extract results based on what happened from a step of a recipe;

storing the number of knowledge types from the number of sources in a scaffolding structure, wherein an abstraction-decomposition technique is used to organize the number of knowledge types based on an analysis of a physical domain in which the steps of the recipe are executed and how functional purposes are to be achieved within constraints provided by the physical domain; and

identifying one or more modifications of the steps of the recipe based on the knowledge types.

30. (Previously Presented) The computerized method of claim 29, wherein the symbolic learning approach includes an explanation-based learning approach.

31. (Previously Presented) The computerized method of claim 29, wherein the empirical approach includes a memory based learning approach.

32. (Previously Presented) The computerized method of claim 29, wherein the number of sources are independent of each other.

33. (Previously Presented) A computer-readable medium having computer-executable instructions for a method comprising:

extracting a number of knowledge types from a number of sources, wherein one of the number of sources is a source based on a symbolic learning approach to extract reasons for an outcome of a step of a recipe and wherein a different one of the number of sources is a source based on an empirical approach to extract results based on what happened from a step of a recipe;

storing the number of knowledge types from the number of sources in a scaffolding structure, wherein an abstraction-decomposition technique is used to organize the number of knowledge types based on an analysis of a physical domain in which the steps of the recipe are

executed and how functional purposes are to be achieved within constraints provided by the physical domain; and

identifying one or more modifications of the steps of the recipe based on the knowledge types.

34. (Previously Presented) The computer-readable medium of claim 33, wherein the symbolic learning approach includes an explanation-based learning approach.

35. (Previously Presented) The computer-readable medium of claim 33, wherein the empirical approach includes a memory based learning approach.

36. (Previously Presented) The computer-readable medium of claim 33, wherein the number of sources are independent of each other.

37. (Currently Amended) The computerized method of claim [[1]] 6, wherein the product is selected from the group consisting of chemical products, food and beverage products, and pharmaceutical products.

38. (Previously Presented) The computerized method of claim 1, wherein the tailoring of the production recipe to specific needs is changing the quantity of the product.

39. (Previously Presented) The computerized method of claim 1, wherein the tailoring of the production recipe is to meet specific plant or business needs.

40. (New) The computerized method of claim 1, further comprising:  
analyzing post-production analysis results of the batch of product;  
generating rules and patterns based on the analysis results; and  
modifying the advanced recipe based on the rules and patterns.